LITTLE DELL RESERVOIR

Introduction

Little Dell Reservoir, an impoundment on Dell Creek stores water not only from Dell Creek but diverted water from Parleys Creek located immediately downstream. It is operated in conjunction with Mountain Dell Reservoir for flood control and water supply. Although initially no recreational component was planned, recent interest by area residents has brought about the preliminary development of a recreation plan associated with the reservoir.

The dam is a rolled earthfill structure. It has a maximum height of 224 feet above the streambed and is 1,700 feet in length. When full the reservoir impounds 20,500 acre-feet of water. The project was build through the cooperation of the Metropolitan Water District of Salt Lake City, Salt Lake County and the US Army Corp of Engineers. Construction was essentially completed in 1993. Little Dell Reservoir is maintained at gross pool

Characteristics and Morphometry

Lake elevation (meters / feet)	1,767 / 5,798
Surface area (hectares / acres)	101 / 249
Watershed area (hectares / acres)	7,641 / 18,880
Volume (m^3 / acre-feet)	
capacity	2,528,000 / 20,500
conservation pool	
Annual inflow (m^3 / acre-feet)	11,300
Retention time (years)	1.8
Drawdown (meters / feet)	
Depth (meters / feet)	
maximum	61 / 200.1
mean	25.1 / 82.4
Length (meters / feet)	2,006 / 6,582
Width (meters / feet)	546 / 1,791
Shoreline (meters / feet)	4,907 / 16,100

Location

County	Salt Lake
Longitude / Latitude	111 41 55 / 40 46 25
USGS Map	Mountain Dell, Utah 1961
DeLorme's Utah Atlas and Gazetteer™	Page 53 B-6
(Not labeled on map, just east of Mountain Dell Reservoir)	
Cataloging Unit	16020204

throughout much of the year. The reservoir is periodically drawn down for

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municipal and industrial water supply and irrigation. In the spring the reservoir is drawn down to control possible flooding from snowmelt. Information shows that a water surface area of 140 acres is provided 90 percent of the time during the recreational season.

Recreation

Little Dell Reservoir is located in Salt Lake County about 13 miles east of Salt Lake City in the western Wasatch Mountains. It is located adjacent to State Highway 65 approximately 1 mile northeast of I-80.

Although a recreation component was not developed as part of original plan for the reservoir, plans are proceeding forward to develop a recreational plan associated with the reservoir. Recreational opportunities would be developed that are compatible with dam operations and project purposes. There are certain constraints mandated by a Salt Lake City Watershed Ordinance. These include: no potable water services directly from the lake, no swimming, bathing or washing within the lake, picnicking limited to restricted areas, no operations of motorized boats and limited day-use only. In addition there are other physical and environmental constraints that could influence full development of a recreational project. Given these constraints there are still about eight potential recreational opportunities being defined for consideration. They include hiking, fishing with flies and artificial lures only, boating, picnicking, sightseeing, wind surfing, camping, and fishing. Furthermore, incidental winter use including cross-country skiing will be an opportunity considered.

There is no plan to allow camping within the project lands but camping facilites are located at Affleck Park, 3 miles north of the reservoir. Facilities at Affleck Park include picnic tables, open play and camping areas and trails in the canyon areas.

Watershed Description

Little Dell Reservoir is an impoundment of Dell Creek, a tributary to Parleys Creek. Water entering the reservoir would be comprised of water from Dell Creek and diverted water from Parleys Creek. The north side of the reservoir is gently rolling terrain with several small knolls which slightly extend into the waters edge. Much of the terrain is very steep. A relatively small flat area exists northwest of the reservoir and south of State Highway 65.

The watershed high point, Murdock Peak, is 2,927 m (9,602 ft) above sea level, thereby developing a complex slope of 14% to the reservoir. Inflow is from Dell Creek and Parleys Creek. The outflow is a Dell Creek a tributary of Parleys Creek that enters into Mountain Dell Reservoir a short distance downstream.

The geology of the project area is made up of rocks which range in age from Jurassic to Quaternary. The soil in the watershed are residual clay or silty-clay soil derived from bedrock of shales, shaley sandstone, and lime shales. The soils surrounding the reservoir are a mix of reddish clay and rock.

The vegetation communities are composed of low-growing plant associations. The north facing hillside is dominated by scrub oak interspersed with rabbit brush, sagebrush, and snowberry. The south facing slope is primarily a sagebrush and bitterbrush association with an undergrowth of brome grass and other grasses and herbs. The upper watershed is composed primarily of aspen, pine, spruce-fir and alpine. The watershed receives 64 cm (25 inches) of precipitation annually with a frost-free season of 80 - 120 days.

Land use is multiple use with restrictions to protect the watershed for a municipal water supply.

Limnological Assessment

According to the 1994 data, water quality of Little Dell Reservoir is considered excellent. It is considered to be hard with a hardness concentration value of approximately 176 mg/L (CaCO3). There are no

Limnological Data

Data sampled from STORET site: 591168

Surface Data	1992	1994
Trophic Status	E	O
Chlorophyll TSI	57.86	28.41
Secchi Depth TSI	48.64	31.26
Phosphorous TSI	56.60	50.85
Average TSI	54.37	36.84
Chlorophyll a (ug/L)	16.1	0.8
Transparency (m)	2.2	7.3
Total Phosphorous (mg/L)	38	25
pH	8.7	8.3
Total Susp. Solids (mg/L)	3	3.7
Total Volatile Solids (mg/L)	1	2
Total Residual Solids (mg/L)	2	2
Temperature (°C / °f)	16/61	20/68
Conductivity (umhos.cm)	41	340
Water Column Data		
Ammonia (mg/L)	0.12	0.03
Nitrate/Nitrite (mg/L)	0.06	.10
Hardness (mg/L)	31	176
Alkalinity (mg/L)	33	176
Silica (mg/L)	7.2	-
Total Phosphorus (ug/L)	113	24
Miscellaneous Data		
Limiting Nutrient		P
DO (Mg/l) at 75% depth		5.5
Stratification (m)		14
Depth at Deepest Site (m)		26.9

parameters monitored that have exceeded State water quality standards for defined beneficial uses is phosphorus. In 1994 the average concentration of total phosphorus in the water column was 24 ug/L which is below the recommended pollution indicator for phosphorus of 25 ug/L. A review of the September 9, 1994 profile indicates that generally dissolved oxygen is fairly stable throughout the water column and that the reservoir is stratified at a depth of 14 meters. The existing data suggest that the reservoir is currently a phosphorus limited system. TSI values indicate the reservoir is oligotrophic.

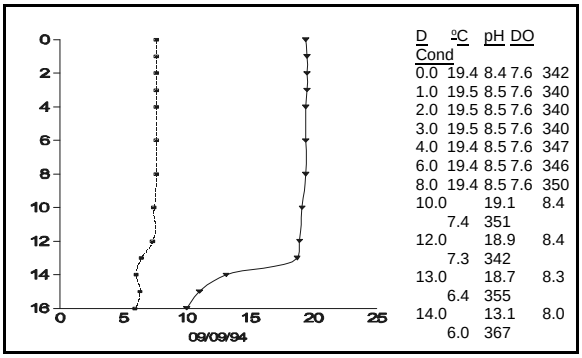
It should be noted that the water quality data from 1992 is significantly different from 1994. This data was not used in the overall projections for the reservoir because the data was collected shortly after the reservoir was filled. It is not uncommon for newly impounded waters to be more productive, higher in nutrients, than a stabilized reservoir. It is apparent from the 1994 data is more indicative of the long term water quality for the reservoir.

According to DWR no fish kills have been reported in recent years. Although the DWR stocking reports at this time indicate that the reservoir has not been stocked with game fish, Dell Creek and Parleys Creek contain populations of brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), and native cutthroat trout (*Oncorhynchus clarki*).

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm^3/liter)	% Density By Volume
Microcystis incerta	0.167	84.27
Centric diatoms	0.012	5.90
Pennate diatoms	0.009	4.49
Oocystis sp.	0.008	4.21
Chlamydomonas sp.	0.002	1.12
Total	0.198	
Shannon-Weaver [H']	0.63	
Species Evenness	0.39	
Species Richness	0.21	

As observed, although the reservoir is predominately populated by blue-green algae indicative of eutrophic conditions, the amount of production is fairly low.



Pollution Assessment

Nonpoint pollution sources include: human wastes and litter from recreation. There are no domestic animals permitted in the watershed.

There are no point pollution sources in the watershed.

Beneficial Use Classification

Although the reservoir has not yet been classified proposed state beneficial use classifications include: culinary (1C), boating and similar recreation (excluding swimming) (2B), and cold water game fish and organisms in their foodchain (3A).